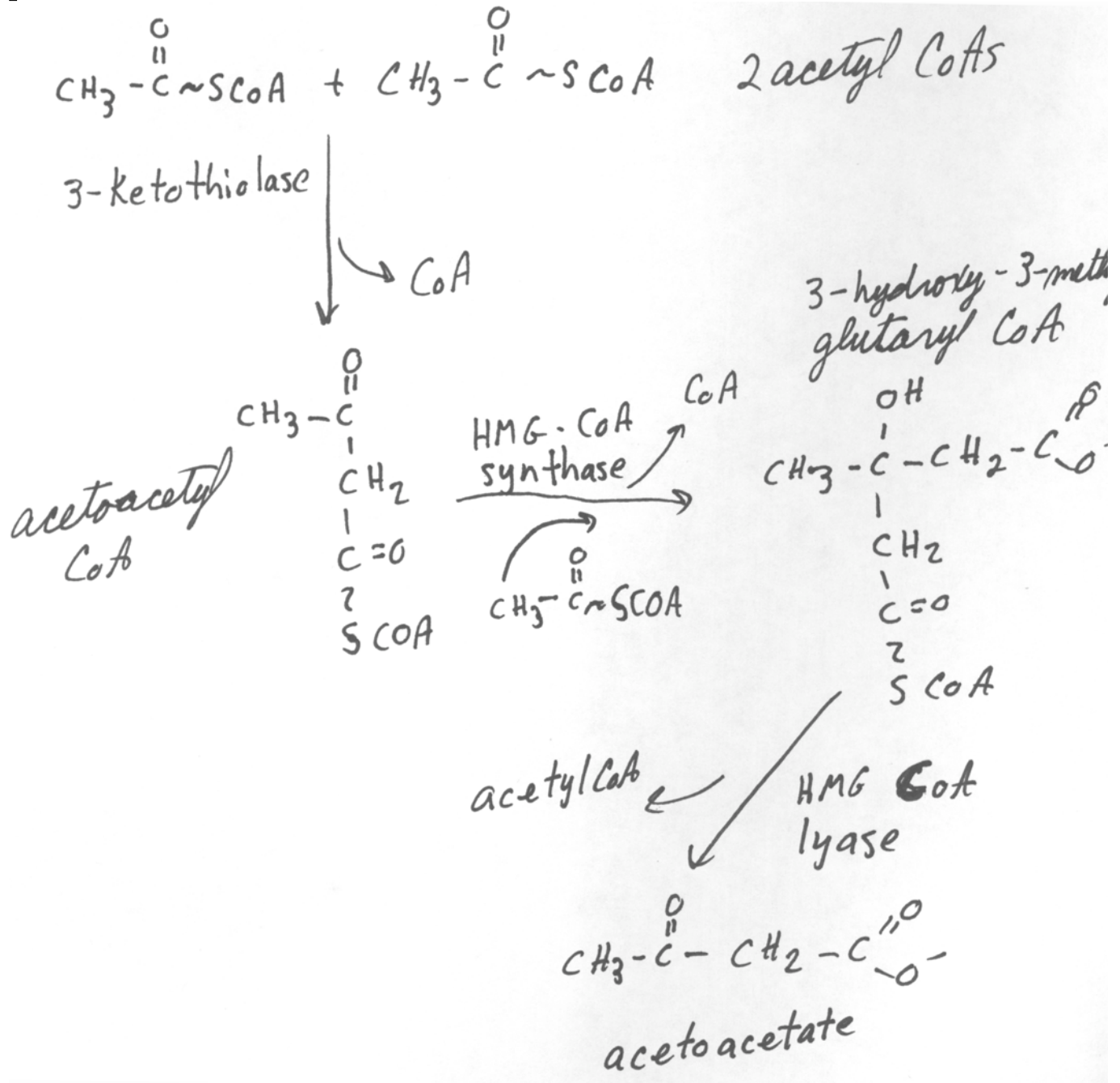


Fatty Acid Metabolism II--11/4/02.

1. What are ketone bodies?

Ketone bodies are α -ketoacids produced by the liver during fasting and during pathological conditions that increase lipolysis (uncontrolled Type I diabetes, for instance). They are used as a fuel source by the peripheral tissues during fasting and by the brain during starvation.

Draw the pathway from the condensation of acetyl CoA to the production of acetoacetate.



How is acetone produced?

By the spontaneous decarboxylation of acetoacetate.

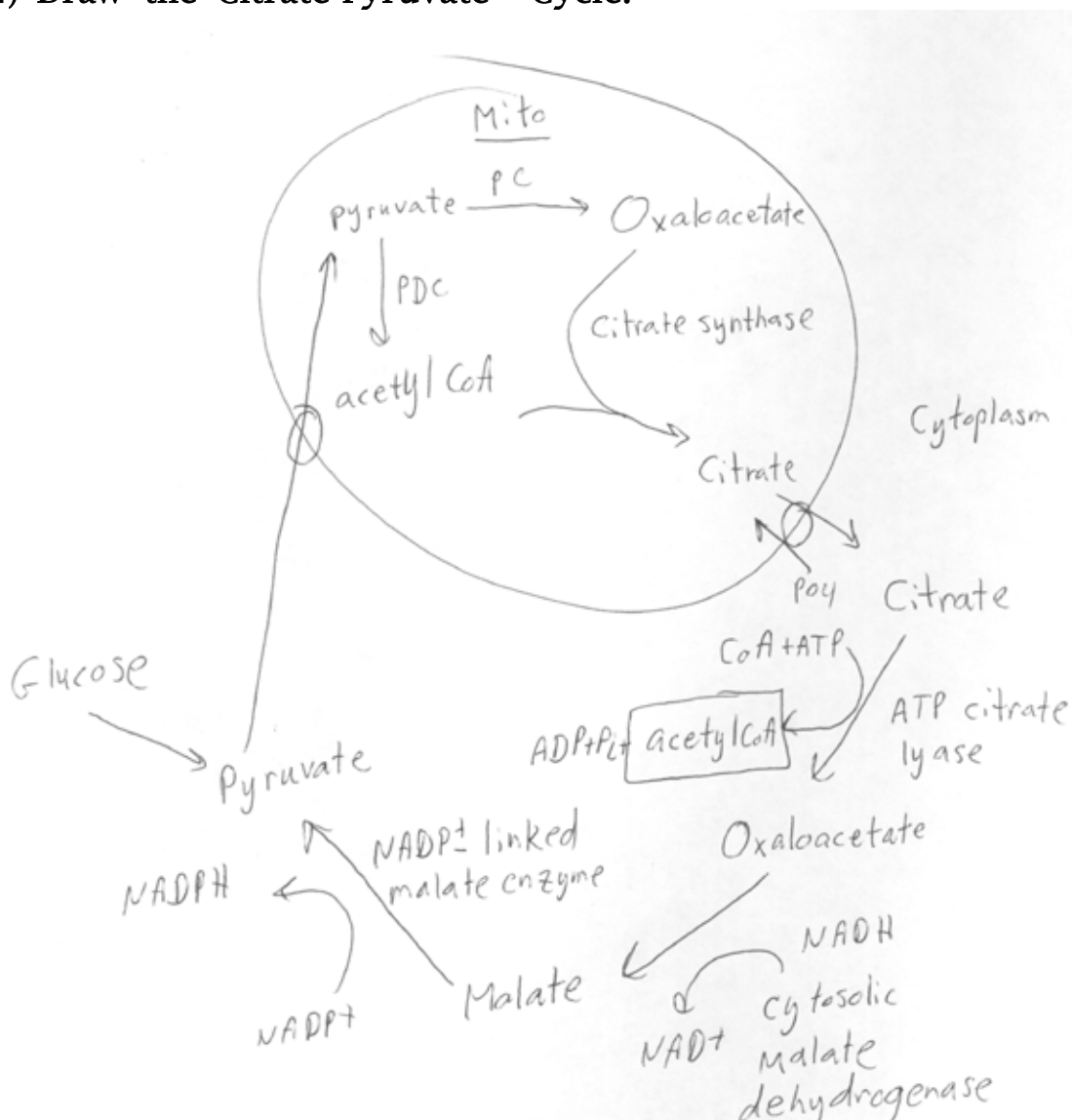
How can peripheral tissues utilize acetoacetate as a fuel?

Peripheral tissues contain both the 3-ketothiolase and the succinyl CoA: acetoacetate CoA transferase enzymes that are required to generate acetyl CoA from acetoacetate.

Why can't the liver?

The liver lacks the succinyl CoA: acetoacetate CoA transferase, therefore, it cannot utilize ketone bodies as fuel.

2) Draw the Citrate-Pyruvate Cycle.



What two compounds does it supply that are needed for FA synthesis?

acetyl CoA and NADPH

One of these two compounds provided by the Citrate-Pyruvate Cycle is insufficient for the needs of fatty acid synthesis. Which one, and where does the rest come from?

NADPH, the rest comes from the pentose phosphate shunt.